

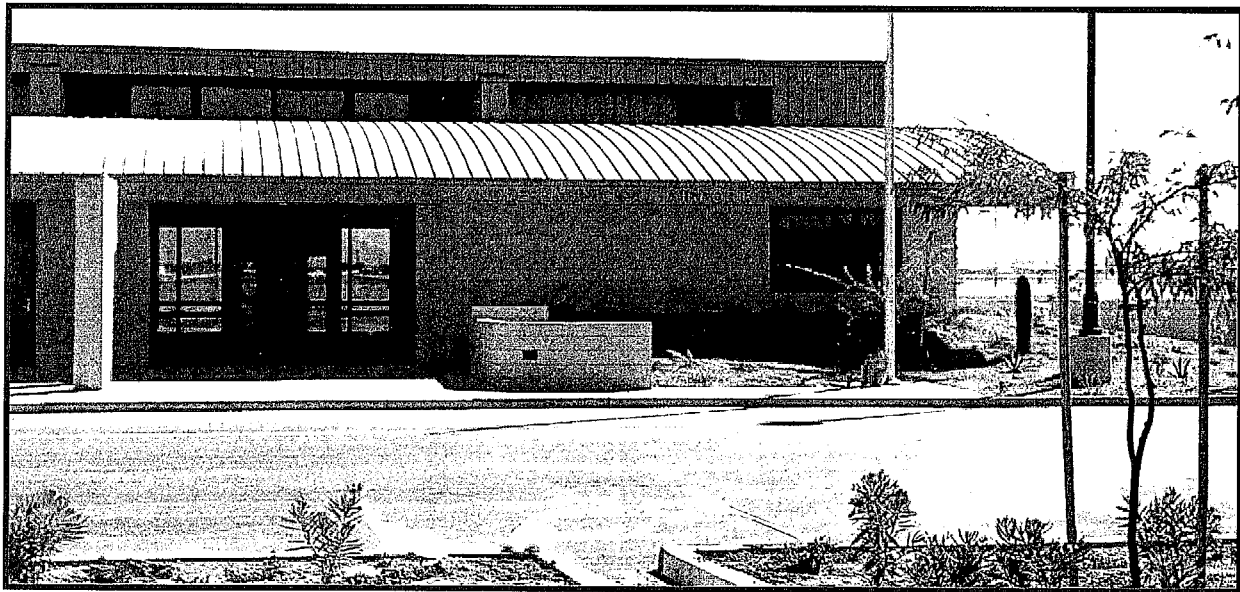
CHANDLER MUNICIPAL AIRPORT
AIRPORT MASTER PLAN

Chapter One INVENTORY

INVENTORY



CHANDLER
MUNICIPAL
AIRPORT



The inventory of existing conditions at Chandler Municipal Airport will serve as an overview of the airport, its facilities, its role in regional and national aviation systems, and the relationship to development which has occurred around the airport over the years. The information delineated in this chapter attempts to provide a foundation, or starting point, for all subsequent evaluations.

The development of a master plan for Chandler Municipal Airport required the collection and evaluation of information relating to the airport and surrounding area including the following.

- Physical inventories and descriptions of facilities and services now provided at the airport.

- Background information pertaining to the Chandler area and descriptions of development which has taken place in the airport environs recently.
- Population and socioeconomic information which provides an indication of the market and possible future development in both the Chandler and Maricopa County areas.
- An overview of existing local and regional plans and studies to determine their potential influence on the development and implementation of the airport master plan.

An accurate and complete inventory is essential to the success of a master plan. This information was obtained

through on-site investigations of the airport and interviews with airport management, airport tenants, representatives of various government agencies, and regional economic agencies. Information was also obtained from available studies concerning the airport and Maricopa County area, including the previous **Airport Master Plan Update** (1982), the Maricopa Association of Governments (MAG) **Regional Aviation System Plan (RASP)** (1993), the **MAG RASP Implementation Study** (1996), and the **1995 Arizona State Aviation Needs Study**.

AIRPORT DEVELOPMENT HISTORY

The City of Chandler acquired the present airport site with federal aid in 1948. The land was purchased from the Roosevelt Water Conservation District for a total of \$8,000.

At the time of purchase, the airport site consisted of a single runway (18-36). The City completed its first improvement project at the airport in 1950 which included regrading the runway and drilling a well to serve the airport's water needs. In 1960, the City constructed a new runway measuring 2,610 feet long oriented in a northeast-southwest manner (existing Runway 4L-22R). A full-length parallel taxiway system and apron area was also constructed at this time. In 1961 the runway was equipped with a lighting system. All of these projects were federally funded.

In the mid 1970's the City extended Runway 4-22 and the parallel taxiway 1,200 feet to the southwest. The project also included the installation of a new runway lighting system, visual approach slope indicators (VASI's) at each end of the runway, installation of airport perimeter fencing, and paving of a new aircraft parking apron.

Since 1987, the City has received a total of \$4,585,000 from the Arizona Department of Transportation (ADOT), Aeronautics Division to improve the Chandler Municipal Airport. Over the same period, the City has also received FAA grants for airport improvement projects totaling \$17,753,243. Development projects funded with ADOT and/or FAA funds over the past 10 years include the construction of parallel Runway 4R-22L, taxiway construction, apron construction, land acquisition, and the recently constructed terminal building.

CHANDLER AIRPORT COMMISSION

The City of Chandler has established a seven member committee known as the Chandler Airport Commission. Appointed by the mayor with approval of the City Council, each member of the commission serves a three year term. City code calls for one member to be a resident of Sun Lakes. One member must also be from the City Council in a role to serve as a liaison between the commission and the City Council. The Airport Manager serves as the commission secretary.

The Commission has the power to establish and publish rules and regulations with the approval of the City Council. The commission has been granted the following powers:

- recommend and make suggestions to the council and all other public agencies concerning plans for the future growth, development, and beautification of the Chandler Municipal Airport and its immediate environs
- review and recommend to the City Council, proposed land uses relating to leases and fixed base operations
- recommend and make suggestions to the City Council on establishment of policy governing airport operations, the annual budget, and rates and fees to be charged for all airport users

AIRPORT SETTING

The City of Chandler is located in the southeastern corner of Maricopa County, approximately ten miles southeast of Phoenix. Situated in a desert environ, Chandler experiences hot summers, mild winters, and relatively small amounts of precipitation. Chandler is often referred to as the "Silicon Desert" because it is the fastest growing high-technology manufacturing city in the west. The city is strategically located in the path of growth of metropolitan Phoenix, one of the fastest growing urban centers in the nation.

As indicated on **Exhibit 1A**, the Chandler Municipal Airport is located in a primarily agricultural area near the eastern bounds of the city. Owned and operated by the City of Chandler, the airport is situated on 394 acres of land and is afforded direct ground access via the on-airport access road (Airport Boulevard) which is linked to arterial roadways Germann Road to the north and Queen Creek Road to the south.

AIRPORT FACILITIES

This section presents in quantitative and qualitative terms, a description of the existing facilities at the Chandler Municipal Airport. For ease of reference, the section is presented as follows:

- Airside Facilities
- Terminal Area Facilities

AIRSIDE FACILITIES

Airside facilities include runways, taxiways, and airport lighting. Within the discussion of airfield facilities is a presentation of the navigational and landing aids serving the airport. A depiction of the airside facilities at the airport is provided on **Exhibit 1B**. **Table 1A** summarizes airside facility data for the airport.

Runways

The runway system at the airport consists of two runways in a parallel configuration. Runway 4L-22R lies closest to the aircraft parking apron

TABLE 1A
Airside Facilities Data
Chandler Municipal Airport

	Runway	
	4R-22L	4L-22R
Runway Length (feet)	4,850	4,395
Runway Width (feet)	75	75
Runway Surface Material	Asphalt	Asphalt
Runway Load Bearing Strength (lbs.)		
Single Wheel Loading (SWL)	30,000	30,000
Runway Markings	Nonprecision	Basic
Runway and Taxiway Lighting	Medium Intensity	Medium Intensity
Approach Lighting		
Precision Approach Path Indicator (PAPI)	Yes	No
Visual Approach Slope Indicator (VASI)	No	Yes
Runway End Identifier Lights (REIL)	Yes	No
Navigational and Weather Aids	VORTAC* Non-Directional Beacon Global Positioning System Loran-C AWOS-3	
* Sources: Very High Frequency Omnidirectional Range with TACAN capability Airport Facility Directory; Southwest U.S., October 10, 1996; FAA Form 5010, September 17, 1993		

and measures 4,395 feet long by 75 feet wide. Runway 4R-22L is located 700 feet southeast of Runway 4L-22R and measures 4,850 feet long by 75 feet wide. The Runway 4R threshold is located approximately 1,750 feet northeast of the Runway 4L threshold. Each runway is oriented in a northeast-southwest direction. Runway 4L-22R is constructed of asphalt and can support aircraft up to 30,000 pounds single wheel loading (SWL). Single wheel loading refers to the design of the aircraft landing gear which has a single wheel on each main landing gear strut. Runway 4R-22L is constructed of

asphalt as well and can support aircraft up to 30,000 pounds in a single wheel configuration. All runway pavement surfaces have either been constructed or rehabilitated within the past five years.

Taxiways

The taxiway system at Chandler Municipal Airport is identified on **Exhibit 1B**. Taxiway A is a full-length parallel taxiway serving Runway 4L-22R and is located 240 feet northwest of the runway.

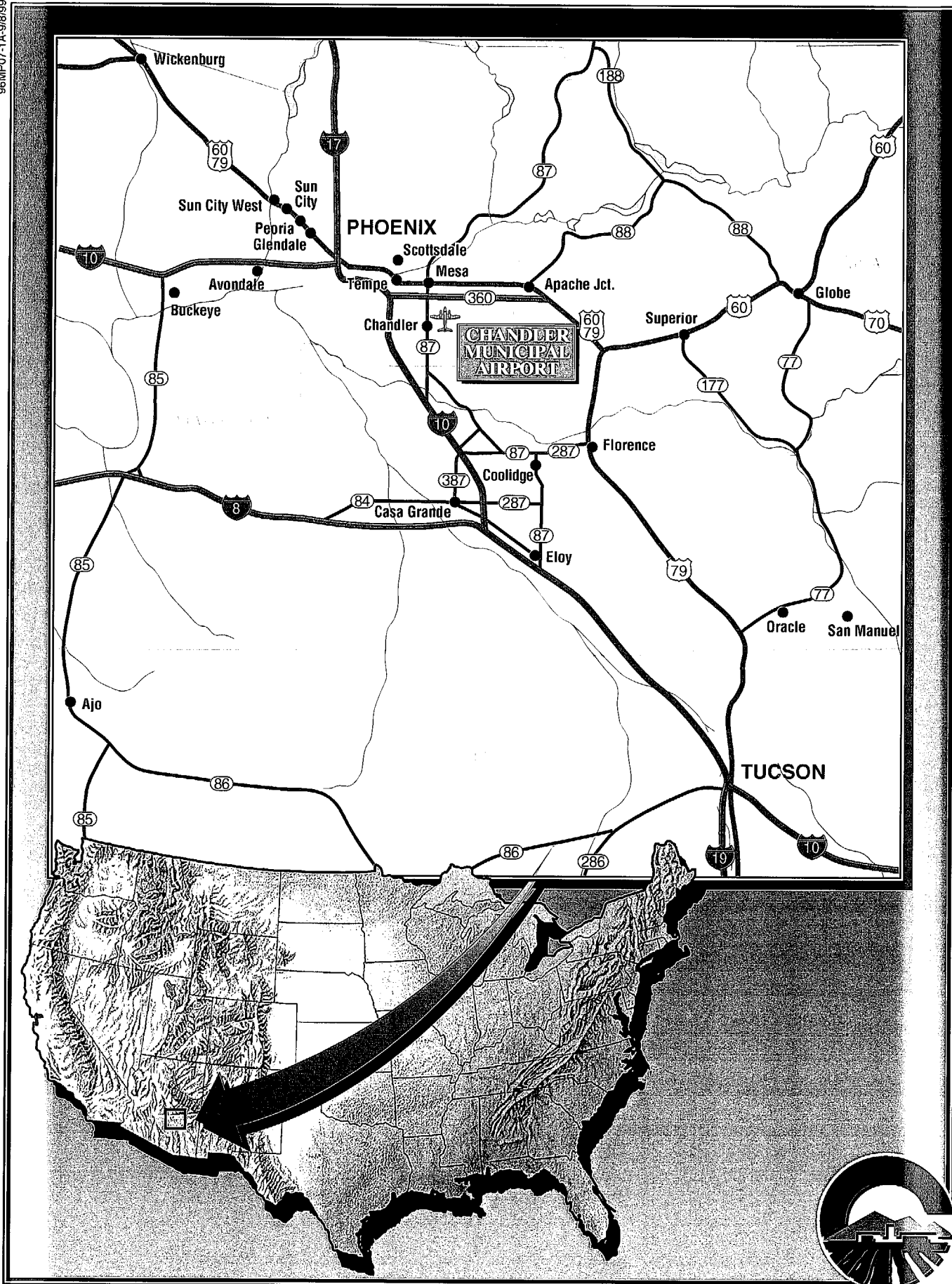
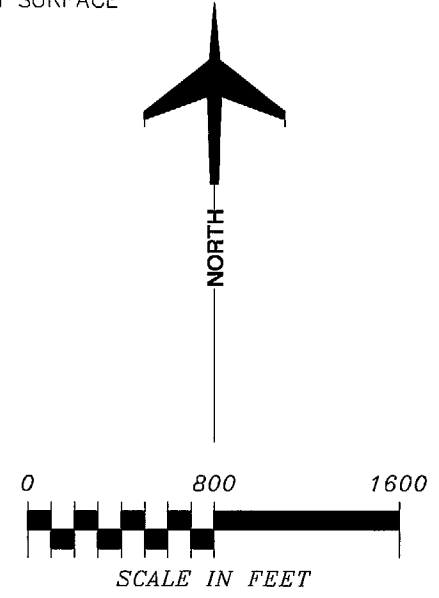
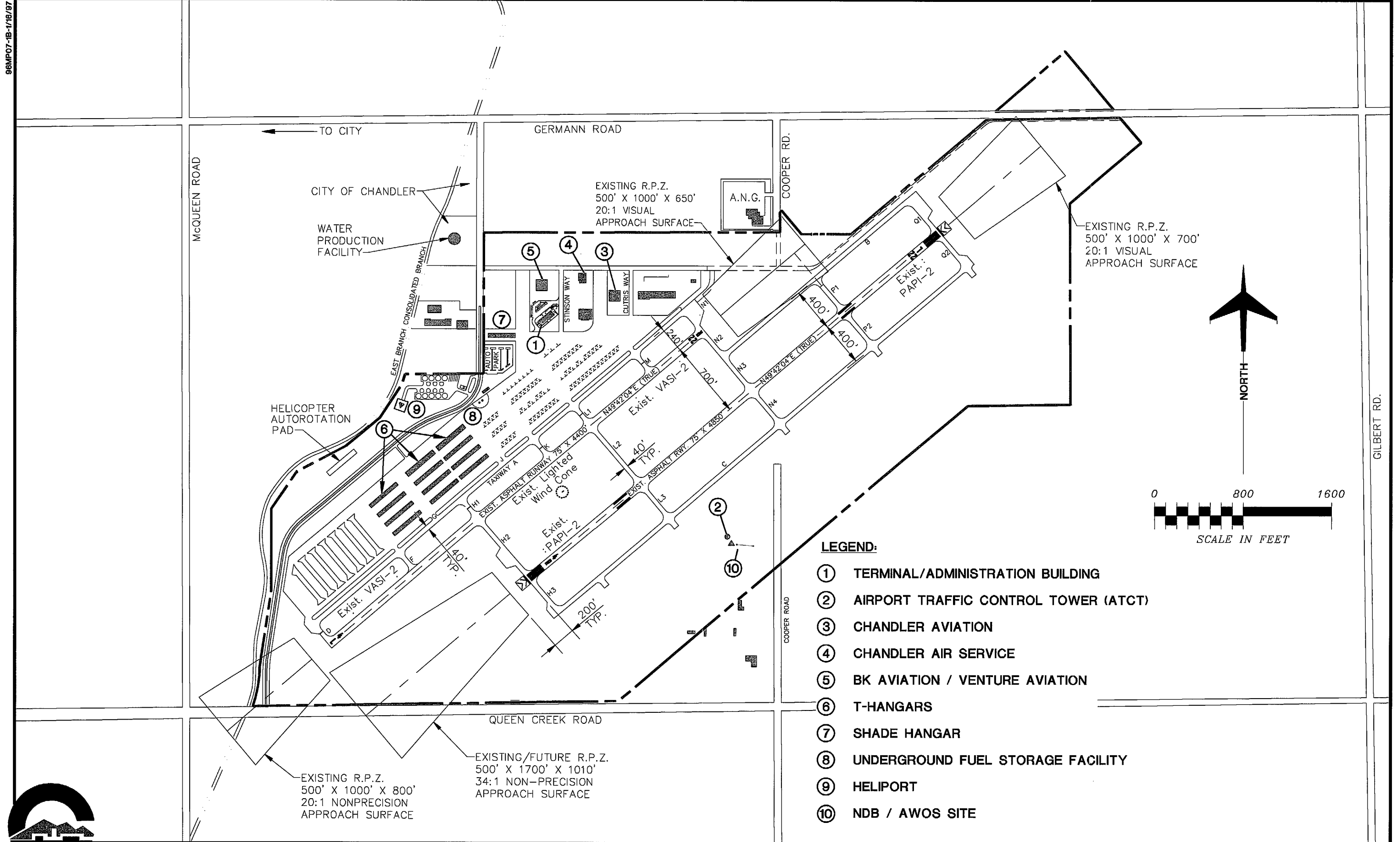


Exhibit 1A
LOCATION MAP



- LEGEND:**
- ① TERMINAL/ADMINISTRATION BUILDING
 - ② AIRPORT TRAFFIC CONTROL TOWER (ATCT)
 - ③ CHANDLER AVIATION
 - ④ CHANDLER AIR SERVICE
 - ⑤ BK AVIATION / VENTURE AVIATION
 - ⑥ T-HANGARS
 - ⑦ SHADE HANGAR
 - ⑧ UNDERGROUND FUEL STORAGE FACILITY
 - ⑨ HELIPORT
 - ⑩ NDB / AWOS SITE



Taxiway B provides access to the Runway 22L end and is located 400 northwest of Runway 4R-22L. Taxiway C is a full-length parallel taxiway serving Runway 4R-22L. Taxiway C is located 400 feet southeast of Runway 4R-22L. Taxiways D, F, K, and M are connecting taxiways which extend between the aircraft parking apron and Runway 4L-22R. Taxiways G and J are connecting taxiways which extend between the aircraft parking apron and parallel Taxiway A. Connecting Taxiway H extends between parallel Taxiway A and parallel Taxiway C, crossing the Runway 4R threshold. Connecting Taxiway L extends between the aircraft parking apron and parallel Taxiway C. Connecting Taxiway N extends between the aircraft parking apron and parallel Taxiway C. Connecting Taxiways P and Q extend between parallel Taxiways B and C. Each taxiway at the airport is 40 feet wide.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport.

The nonprecision markings in place on Runway 4R-22L identify the runway centerline, designation, touchdown point, threshold, and aircraft holding positions. The basic markings on Runway 4L-22R identify the runway centerline, designation, and aircraft holding positions. Taxiway and apron taxilane centerline markings are

provided to assist aircraft using these airport surfaces.

Heliport

The location of the heliport at Chandler Municipal Airport is identified on **Exhibit 1B**. The heliport consists of a parking apron and helipad.

The helipad measures 100 feet by 100 feet and is located on the west side of the apron. A taxiway connects the helipad and parking apron. The apron encompasses approximately 8,600 square yards of pavement and provides approximately seven helicopter parking positions. A maintenance/storage hanger and office/FBO building are located on the north side of the apron. (FBO building dimensions are presented later.)

Airfield Lighting

Airport lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. Several lighting systems are installed at the airport for this purpose. These lighting systems, categorized by function, are described below. All airfield lighting systems at the airport are owned and operated by the City of Chandler.

Identification Lighting: The location of the airport at night is universally indicated by the rotating beacon. A rotating beacon displays flashes of white and green light to identify the airport. The rotating beacon at the

airport is located along Airport Boulevard on the west side of the airport near the row of shade hangars.

Pavement Edge Lighting: Pavement edge lighting utilizes light fixtures placed near the pavement edge to define the lateral limits of the runway or taxiway. Medium intensity pavement edge lighting is provided along all taxiways and runways. While pavement edge lighting is not available along the apron areas, the apron is equipped with street-lamp style lighting fixtures placed along the center of tie-down areas.

Approach Lighting: A visual approach slope indicator (VASI) is installed on each end of Runway 4L-22R. A precision approach path indicator (PAPI) is installed on each end of Runway 4R-22L. A pulsating visual approach slope indicator (PLASI) is installed at the helipad. This system is currently inoperable due to maintenance problems. The approach lighting aids are identical in their purpose of providing visual approach slope guidance to pilots, but vary in their configuration. Each lighting aid, however, consists of a system of lights located near the runway threshold, which when interpreted by the pilot give an indication of being above, below, or on the designed descent path to the runway.

Runway End Identification Lighting: Runway end identifier lights (REIL's) provide rapid and positive identification of the approach end of a runway. REIL's are typically used on runways without more sophisticated

approach lighting systems. The REIL systems consists of two synchronized flashing lights, located laterally on each side of the runway facing the approach aircraft. REIL's are installed at both ends of Runway 4R-22L.

Pilot Controlled Lighting: All airfield lighting systems are controlled through a pilot controlled lighting (PCL) system which allows pilots to control the intensity of the lighting at night from the aircraft with the use of the aircraft's radio transmitter. The PCL system reduces the cost of operating the airfield lighting system by automatically turning-off the lighting systems when they are not in use.

Terminal Area And Enroute Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from the airport include the very high frequency omnidirectional range (VOR) facility, nondirectional beacon (NDB), global positioning system (GPS), and Loran-C.

The VOR, in general, provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility to provide distance as well as directional information to the pilot.

In addition, military tactical air navigation aids (TACAN's) and civil VOR's are commonly combined to form a VORTAC. A VORTAC provides distance and direction information to civil and military pilots. The Willie, Standfield, and Phoenix VORTAC's can be utilized by pilots flying to or from the airport. **Exhibit 1C**, a map of the regional airspace system, depicts the location of these VORTAC's in relation to Chandler Municipal Airport.

The NDB transmits nondirectional radio signals whereby the pilot of properly equipped aircraft can determine the bearing to or from the NDB facility and then "home" or track to or from the station. Pilots flying to or from the airport can utilize the Chandler NDB (owned by the City of Chandler). The Chandler NDB is located on the east side of the airport. Other NDB's in the vicinity of the airport include the Falcon Field, Scottsdale, and Glendale NDB's. **Exhibit 1C** depicts the location of these NDB's.

Loran-C is a ground-based enroute navigational aid which utilizes a system of transmitters located in various locations across the continental United States. Loran-C varies from the VOR and NDB as pilots are not required to navigate using a specific facility (with the VOR and NDB pilots must navigate to and from a specific VOR or NDB facility). With a properly equipped aircraft pilots can navigate to any airport in the United States.

GPS is an additional navigational aid for pilots enroute to the airport. GPS

was initially developed by the United States Department of Defense for military navigation around the world. Increasingly, over the last few years, GPS has been utilized more in civilian aircraft. GPS uses satellites placed in orbit around the globe to transmit electronic signals which properly equipped aircraft use to determine altitude, speed, and navigational information. GPS is similar to Loran-C as pilots can directly navigate to any airport in the country and are not required to navigate using a specific ground based navigational facility.

The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS over the next decade. The FAA phase-out schedule for traditional navigational aids includes VOR's between 2005 and 2010, NDB's between 2000 and 2005, and Loran-C by the year 2000.

Instrument Approach Procedures

When the visibility and cloud ceilings deteriorate to a point where visual flight can no longer be conducted, aircraft must follow published instrument approach procedures to locate and land at the airport. There are two published instrument approaches to the airport. Using the previously mentioned Willie VORTAC or GPS navigational aids, instrument approaches for landing Runway 4L can be made when the visibility is at least one mile and the cloud ceilings are greater than 326 feet above the ground.

Utilizing the Chandler NDB, instrument approaches to Runway 4R can be made when the visibility is at least one mile and the cloud ceiling is greater than 541 feet above the ground. The visibility and cloud minimums are increased for aircraft which conduct instrument approaches to the opposite runway end or when local altimeter settings cannot be used. In addition, the visibility minimum is increased for aircraft with approach speeds greater than 121 knots.

TERMINAL AREA FACILITIES

Terminal area facilities consist of supporting aviation related facilities which are essential to the aircraft and pilot/passenger handling functions. The existing terminal area facilities are outlined in the following section and are depicted on **Exhibit 1B**.

GENERAL AVIATION TERMINAL BUILDING

The newly constructed terminal building is 5,500 square feet providing a flight planning area, restrooms, lobby, conference room/office space, and airport administration offices. The terminal building was constructed with the ability to expand on either side. The new terminal building replaces the previous terminal which will now house an air ambulance.

AIRCRAFT PARKING APRON

The airport maintains 89,600 square yards of aircraft parking apron which provides for 122 aircraft tie-down positions. These tie-down positions are designated for three separate uses: permanent (based aircraft), FBO, and transient (visitor) aircraft. The majority of parking apron is located on the main ramp, with some space located near FBO facilities.

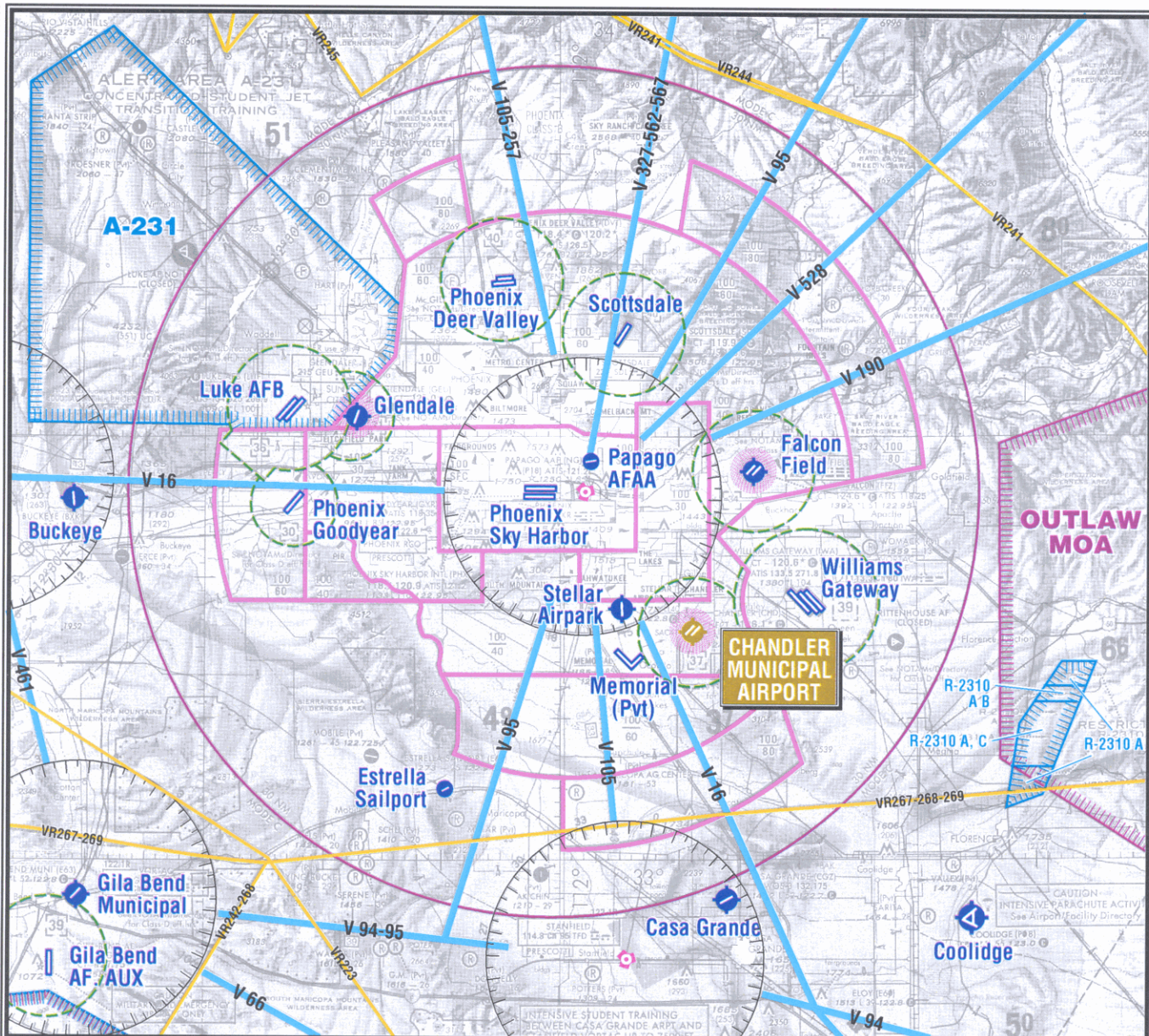
Helipad

The airport is supported by a helipad west of Airport Boulevard. The helipad provides a paved 100-foot by 100-foot landing/takeoff facility for helicopters. The helipad is supported with a taxiway leading to the main helicopter parking ramp.

AIRCRAFT HANGAR FACILITIES

Hangar facilities at Chandler Municipal Airport consist of large conventional hangars, nested T-hangars, and shaded tie-down facilities. All conventional hangar facilities are currently occupied by FBO's and specialty operators.

There are 12 nested T-hangar facilities grouped on the southwestern portion of the apron. These facilities provide 116 individual units for aircraft storage. The airport also provides two T-shade hangar facilities. One facility located west of the terminal building provides



LEGEND

- | | | | |
|--|---|--|---|
| | Hard-surfaced runways 1500 ft. to 8069 ft. | | Prohibited, Restricted, Warning and Alert Areas |
| | Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft. | | Military Operations Area (MOA) |
| | VORTAC | | Class B Airspace |
| | Non-Directional Radiobeacon (NDB) | | Class D Airspace |
| | Compass | | MODE C |
| | Victor Airways | | |
| | Military Training Routes | | |



NORTH
NOT TO SCALE



Exhibit 1C
AREA AIRSPACE

12 aircraft tie-down positions. A ten-unit facility (eight spaces are leasable and the remaining two spaces are used for airport equipment storage) is located northeast of the apron.

It should be noted that the airport maintains a three year waiting list for T-hangar space. City officials are currently soliciting requests from firms to design, construct, and operate additional T-hangars.

FIXED BASE AND SPECIALTY OPERATORS

Chandler Air Service is a full service FBO located on the northeastern portion of the apron. The majority of business conducted by this FBO consists of flight training and aircraft rental. Because of downward trends of general aviation activity, however, the business has diversified into aircraft maintenance and fuel sales. Chandler Air Service employs 15 people and operates from two buildings on a four acre leasehold. The main large conventional hangar provides 10,000 square feet for aircraft maintenance and hangar storage, 5,000 square feet of office space, and 800 square feet for the airport's only restaurant. An additional conventional hangar immediately adjacent and west of the main facility consists of 2,000 square feet of maintenance and hangar space as well as 3,000 square feet of office space.

Chandler Air Service has constructed an above ground 10,000 gallon fuel storage tank which is utilized for storing 100LL Avgas. The FBO also

sells jet fuel which is stored in a 2,200 gallon capacity fuel truck. The FBO estimates that it instructs 30 to 35 students at any given time while maintaining a five year contract with the Federal Bureau of Investigation (FBI) for pilot training in "tail dragger" and acrobatic aircraft. The FBO owns 20 single engine and one multi-engine piston aircraft.

Chandler Aviation is another FBO located on the airport. Chandler Aviation deals strictly in aircraft maintenance and repair operating from a two acre leasehold and two conventional hangars providing 8,000 square feet of office and 7,200 square feet of hangar space. Chandler Aviation employs seven people and maintains 21 tie-down positions on the ramp adjacent the hangar. Sunbird Flight School is a sub-tenant of Chandler Aviation and maintains office space within the Chandler Aviation conventional hangar. Chandler Air Service has sublet 1,200 square foot of conventional hangar space to Sunbird for aircraft maintenance. Sunbird employs nine full-time and four part-time and leases two tie-downs and two T-hangars. Chandler Aviation owns one single engine aircraft while Sunbird owns ten aircraft (nine single engine and one multi-engine piston aircraft).

Venture Aviation is a full service FBO located behind the recently constructed terminal building. This FBO employs 1 full-time individual and five part-time flight instructors in providing flight training and aircraft maintenance. The FBO operates from a conventional hangar with 3,000 square feet of office

and 5,500 square feet of hangar space. Venture Aviation has leased a 12,000 gallon fuel storage tank from the City of Chandler and owns a 750 gallon capacity fuel truck which provides fuel for the FBO's 10 aircraft (nine single engine aircraft and one 90 series King Air turbo prop). The FBO indicated that retail fuel sales is planned for January, 1997. Venture has on average 25 students and maintains 20 aircraft tie-downs.

Quantum Helicopters is another FBO located on the airport. The FBO has six employees and provides helicopter flight training (80% of the business), charter, and aerial photography. Quantum Helicopters also works approximately once per month with the Chandler Police Department aiding the department with aerial reconnaissance. This operator operates from a facility providing 3,600 square feet of hangar space and 2,100 square feet of office space. Quantum Helicopters owns three Robinson 22 helicopters and one Hughes 500 helicopter and maintains on average 11 to 15 students.

FUEL FACILITIES

The City of Chandler owns four fuel tanks located underground adjacent the heliport. Included in the fuel farm is a 10,000 gallon tank storing 80/87 octane fuel, two 8,000 gallon steel tanks storing 100LL, and one fiberglass 12,000 gallon tank leased to Venture Aviation for storage of 100LL Avgas. The City receives \$0.10 per gallon fuel flowage fee from FBO fuel retailers and an additional \$0.06 per gallon storage

fee from Venture Aviation. The City also operates a self-service fuel island located on the apron west of the terminal building.

As previously mentioned, Chandler Air Service has constructed an above ground 10,000 gallon fuel storage tank which is utilized for storing 100LL Avgas. The FBO also sells jet fuel which is stored in a 2,200 gallon capacity fuel truck.

UTILITIES

The availability and capacity of the utilities serving the airport are factors in determining the development potential of the airport property, as well as the land immediately adjacent to the facility. Of primary concern in the inventory investigation is the availability of water, gas, sewer, electrical, and communication sources.

Electrical service is provided to the airport by the Salt River Project (SRP) with all power lines on airport property located underground. U.S. West Communications provides telephone service with underground lines. The telephone line (T-1 line) leading to the recently constructed terminal building is a digital line.

Sanitary sewer service which is provided by the City of Chandler serves the new terminal building only. Wastewater disposal for all other facilities on the airport is accommodated through septic systems. Natural gas is not currently available

on the airport. The City of Chandler supplies water to the airport.

Auto Parking

Auto parking facilities at the airport include a main parking lot adjacent to the general aviation terminal building, a parking lot adjacent to the previous terminal building, and paved/unpaved areas adjacent to the FBO's and specialty operators. The airport currently provides approximately 245 parking spaces with approximately 75,000 square feet of space.

AIRSPACE AND AIR TRAFFIC CONTROL

The FAA Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigation facilities; airports and landing areas; aeronautical charts; associated rules, regulations and procedures; technical information; personnel and material. System components shared jointly with the military are also included.

AIRSPACE STRUCTURE

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for two basic categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G.

Class A airspace includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL). Class B airspace is controlled airspace surrounding high activity commercial service airports (i.e. Phoenix Sky Harbor International Airport). Class C airspace is controlled airspace surrounding lower activity commercial service and some military airports. Class D airspace is controlled airspace surrounding airports with an air traffic control tower.

All aircraft operating within Class A, B, C, and D airspace must be in constant contact with the air traffic control facility responsible for the particular airspace. Class E airspace is controlled airspace that encompasses all instrument approach procedures and low altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. Class G airspace is uncontrolled airspace.

Airspace in the vicinity of Chandler Municipal Airport is impacted by the number of airports and high level of aircraft activity in the Phoenix metropolitan area. Airspace in the vicinity of Chandler Municipal Airport is depicted on **Exhibit 1C**. The airport is located within Class D airspace. The Class D airspace for Chandler Municipal Airport extends outward from the center of the airport to a radius of four nautical miles, and stretches from the surface to 3,700 feet MSL. During periods when the control tower is not active the Class D airspace surrounding Chandler Municipal Airport reverts to Class E airspace.

Chandler Municipal Airport also underlies the Class B airspace surrounding Phoenix Sky Harbor International Airport. The Class B airspace surrounding Phoenix Sky Harbor International Airport provides for areas of controlled airspace along primary arrival routes to the airport. The boundaries of the Class B airspace vary to provide for operations to surrounding suburban airports. The Class B airspace extends from the surface to 10,000 feet near the airport. The floor of the Class B airspace gradually increases outward from the airport which allows for aircraft operations under the Class B airspace. An area of Class E airspace surrounds the entire Phoenix Metropolitan Area due to the number of airports and high level of activity in the area.

Approximately 22 nautical miles east of the airport is an area of special-use

airspace designated as a Military Operations Area (MOA). MOA's define areas of high level military activity and are intended to segregate military and civilian aircraft. While civilian operations are not restricted within an MOA, civilian aircraft are cautioned to be alert for military aircraft when operating in the MOA. Military operations within the Outlaw MOA are normally conducted between 7:00 a.m. and 8:00 p.m. Monday through Friday between 3,000 and 8,000 feet above the ground.

An area of restricted airspace is located approximately 25 miles southeast of the airport. Restricted airspace surrounds areas of significant hazard to aircraft operations such as artillery firing, aerial gunnery, or guided missiles. Restricted areas R-2310 A, B, and C operate intermittently and at altitudes between 10,000 and 35,000 feet. While civilian aircraft operations are not prohibited, aircraft operations are restricted during the specified times and between the defined altitudes.

For aircraft enroute or departing the Phoenix metropolitan area using VOR navigational facilities, a system of Federal Airways, referred to as Victor Airways, has been established. Victor airways are corridors of airspace eight miles wide that extend upward from 1,200 feet MSL to 18,000 feet MSL that extend between VOR navigational facilities. All Victor Airways in the Phoenix metropolitan area emanate from the Phoenix VORTAC and are depicted on **Exhibit 1C**.

AREA AIRPORTS

There are a number of airports of various sizes, capacities, and functions within and just outside of the airport service area as indicated on **Exhibit 1C, Area Airspace**. Generally, airports which have any significant influence on Chandler Municipal Airport are in approximately a 30 nautical mile range. The airports described below are those within approximately 30 nautical miles of Chandler Municipal Airport or are important to the airspace and control environment of the area. Information pertaining each airport was obtained from the **MAG RASP Implementation Study** (1996) and the FAA's 5010 Forms.

Phoenix Sky Harbor International Airport (PHX) is located 14 nautical miles northwest of the Chandler Municipal Airport in the heart of Phoenix. The airport is owned and operated by the City of Phoenix and is the largest air carrier airport within the State of Arizona, and the only commercial jet airport within the Phoenix area. Sky Harbor is served by all of the major airlines with Southwest and America West utilizing the airport as a hub. In 1995, the airport ranked tenth among domestic airports with over 13.7 million enplanements.

Phoenix Sky Harbor is equipped with two 150 foot wide parallel runways over 10,000 feet in length. An array of instrument approach aids, including an instrument landing system (ILS), aid pilots on approach during inclement weather conditions. The airport is

served by seven published instrument approaches with the ILS 8 approach certified for Category I weather minimums (200 foot cloud ceiling and one-half mile visibility).

Although the airport's primary role is to provide commercial service to the area, the airport also serves general aviation activity. The airport has approximately 283 based aircraft including seven jets and 8 helicopters. FBO services and aircraft tie-down and hangar storage is also provided.

Casa Grande Airport is a public use airport located approximately 19 nautical miles south of the Chandler Municipal Airport. The airport is served by Runway 5-23 which extends 5,200 feet long by 100 feet wide. The runway is served by an instrument landing system. Approximately 47 aircraft are based at the airport.

Coolidge Airport, situated 28 nautical miles southeast of the airport, is owned and operated by the City of Coolidge. The airport is served by two runways with Runway 5-23 providing the greatest length at 5,550 feet long by 150 feet wide. Coolidge Airport currently has one based aircraft.

Eloy Airport is located 30 nautical miles southeast of the airport. The airport is served by a single Runway 2-20 measuring 3,900 feet long by 60 feet wide. Approximately 41 aircraft are based at the airport.

Estrella Sailport is situated 21 nautical miles southwest of Chandler Municipal Airport. The public use

airport is privately owned and provides four unpaved runways (three of which are parallel runways). An estimated 98 aircraft including 80 single engine, three multi-engine, and 15 gliders are based at the airport.

Glendale Municipal Airport is located 27 nautical miles northwest of Chandler Municipal Airport. The airport is owned by the City of Glendale and is served by one runway. Runway 1-19 is 5,350 feet long by 75 feet wide and is equipped with REIL's, and precision approach path indicators (PAPI). The airport is served by an air traffic control tower (ATCT) and an on-site NDB. Approximately 182 fixed wing aircraft and two helicopters are based at the Glendale Municipal Airport. A full range of FBO services are provided including major aircraft maintenance and repair, aircraft charter, aircraft rental and fuel sales.

Phoenix Deer Valley Airport is located 28 nautical miles northwest of Chandler Municipal Airport. The airport is served by parallel runways with Runway 7R-25L providing the greatest runway length measuring 8,200 feet long by 100 feet wide. Approximately 803 aircraft are based at the airport including four business jets and seven helicopters. The airport is served by an air traffic control tower and provides a full range of FBO services.

Phoenix Goodyear Municipal Airport, is located 29 nautical miles to the northwest of Chandler Municipal Airport. Owned and operated by the City of Phoenix, the airport is

designated as a reliever airport to Sky Harbor International Airport. The airport has a single runway (3-21) which is 8,500 feet long by 150 feet wide. Served by an ATCT, the airport is home to 143 aircraft.

Mesa Falcon Field Airport, located 11 nautical miles northeast of Chandler Municipal Airport, is owned and operated by the City of Mesa. The airport is supported by parallel runways oriented in a northeast-southwest direction. Runway 4R-22L provides the greatest length measuring 5,100 feet long by 100 feet wide. An estimated 552 aircraft are based at the airport most of which are single engine piston aircraft. The airport is also served by an air traffic control tower and an on-site NDB.

Memorial Airfield is a private airport located 3 nautical miles southwest of Chandler Municipal Airport. The airport is served by a single runway (12-30) at 8,577 feet long by 100 feet wide. Approximately 15 aircraft are based at the airport.

Scottsdale Airport, located 20 nautical miles north, is owned and operated by the City of Scottsdale. The airport is served by Runway 3-21 which is 8,251 feet long by 75 feet wide and an air traffic control tower. Approximately 400 aircraft including 24 business jets are based at the airport.

Stellar Airpark is a privately owned airport open to public use. Located five nautical miles northwest of Chandler Municipal Airport, the airport is served by Runway 17-35 which is 4,005 feet

long by 55 feet wide. Approximately 101 aircraft are based at the airport including 86 single engine, five multi-engine, and nine helicopter aircraft.

Williams Gateway Airport is owned and operated by the Williams Gateway Airport Authority. The airport is served by three parallel runways with Runway 12R-30L the longest (10,401 feet long by 150 feet wide). The airport is a recently converted Air Force Base and plans currently call for the airport to serve air carrier, general aviation, and cargo operators. The airport is currently served with an airport traffic control tower and an instrument landing system.

Several private airports ranging from dirt strips to full-service paved facilities are located near the Chandler Municipal Airport. Stellar Airpark is an example of a public-use airport which is privately owned. A number of others, however, are restricted to use by the public. These airports are illustrated on **Exhibit 1C**.

AIR TRAFFIC CONTROL

Aircraft operating within the Class D airspace surrounding the airport are controlled by air traffic control personnel located on the airport. A temporary air traffic control tower has been established on the southeast side of the airport approximately midway along Taxiway C. Air traffic control services are provided at the airport by Serco Aviation Services Corporation through a contract with the FAA.

Aircraft operating within the Class B airspace surrounding Phoenix Sky Harbor International Airport or aircraft operating an instrument flight to airports in the Phoenix metropolitan area are controlled by Phoenix Approach Control located at Phoenix Sky Harbor International Airport. Aircraft arriving or departing the Phoenix metropolitan area are controlled by the Albuquerque Air Route Traffic Control Center (ARTCC). The Albuquerque ARTCC controls aircraft in a large multi-state area.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data related to the Chandler area was collected for use in various elements of this master plan. This information is essential in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport. Aviation forecasts are often directly related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time.

POPULATION

The size and structure of the local community and the service area that the airport supports are important factors to consider when planning airport facilities. These factors provide an understanding of the economic base

that is needed to determine future airport requirements. Due to its unique locale, Maricopa County is a prime destination for vacationers and seasonal residents making it difficult to determine the true permanent popul-

ation. Historical population data presented in **Table 1B** for Maricopa County and the State of Arizona was obtained from Arizona Department of Economic Security.

TABLE 1B Historic Population Estimates						
Year	City of Chandler	Annual % Growth	Maricopa County	Annual % Growth	State of Arizona	Annual % Growth
1980	29,673	n/a	1,509,175	n/a	2,716,546	n/a
1990	90,533	11.80	2,122,101	3.47	3,665,228	3.04
1995	128,035	7.18	2,551,765	3.8	4,228,900	2.90
Source: Chandler Profile prepared by City of Chandler Economic Development Division						

Historical population for the City of Chandler was obtained from Maricopa Association of Governments as presented in the **Chandler Profile** prepared by the City of Chandler Economic Development Division. According to this information, the City of Chandler has experienced significant yearly population increases between 1980-1995 growing at an average annual rate of 10.2 percent.

Since 1990, the city population is estimated to have grown 59 percent. Population growth of the City of Chandler outpaced both the county and state annual growth rates. Moreover, the **Chandler Profile** indicated that the 1996 population reached 143,505, growing at a rate of 1,000 new residents per month in recent months. A decelerated growth rate has been experienced by Maricopa County and the State of Arizona over the last five years.

EMPLOYMENT

Table 1C, Maricopa County Historical Employment by Sector, indicates the distribution of the labor force in Maricopa County between 1970 and 1994. Total employment has grown along with population in Maricopa County. Between 1980 and 1994, total employment within Maricopa County has almost doubled. Between 1970 and 1994 total county employment has tripled.

All employment sectors have experienced growth except for the farm sector which decreased from 9,030 in 1970 to 8,045 in 1994. The mining sector showed the largest annual growth rate increasing at 7.7 percent over the period. Services, however, experienced the largest increase in net jobs expanding from 85,363 in 1970 to 420,255 in 1994, an annual percentage increase of 6.87 percent. In 1994, the

largest employment sectors include services (31.3 percent), finance, insurance, and real estate (30.9 percent), retail trade (17.9 percent), and government (12.1 percent).

Once primarily an agricultural and tourist oriented economy, Chandler has

experienced a successful diversification process in recent years through the attraction and location of high technology industries. This trend is continuing and is causing rapid population growth, which in turn is supporting major commercial and institutional expansion.

TABLE 1C
Historic Total Employment by Sector
Maricopa County

Sector	1970	1980	1990	1994	Annual % Growth Rate
Agriculture, Forestry, Fish, & Wildlife	4,898	9,443	12,790	16,810	5.27
Farm	9,030	9,106	7,516	8,045	-0.40
Mining	460	1,186	2,625	2,772	7.77
Construction	26,564	58,324	69,893	88,419	5.14
Manufacturing	73,257	116,024	143,816	144,668	2.88
Transportation & Public Utilities	20,496	32,828	59,905	64,025	4.86
Wholesale Trade	21,907	41,205	65,778	73,043	5.15
Retail Trade	75,816	141,007	217,279	243,151	4.98
F.I.R.E.*	39,075	82,879	128,656	134,746	5.29
Services	85,363	178,865	366,557	420,255	6.87
Government	72,319	115,913	157,864	164,995	4.17
TOTAL EMPLOYMENT	429,185	786,780	1,232,679	1,360,929	4.93

Source: U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis

* F.I.R.E. - Finance, Insurance, and Real Estate

As indicated in **Table 1D**, a majority of the key employers in the City of Chandler are linked to computer equipment sales and manufacturing. Technical, sales and administrative support held the largest share of employment by occupation at 34.2 percent.

INCOME

Table 1E, Per Capita Personal Income, compares the per capita

personal income (PCPI) for Maricopa County, the State of Arizona, and the United States between 1970 and 1994.

As illustrated by the table, the State of Arizona's PCPI has mirrored that of the United States. Arizona's PCPI ranked 38th in the country at 88 percent of the national average (\$21,696) in 1994. The average annual growth rate of Arizona's PCPI over the 24 year period was 7.0 percent, while the nation's PCPI averaged 7.2 percent annual growth.

TABLE 1D**Key Employers and Occupations by Sector
City of Chandler**

Company Name	Product
Intel Corporation	Microchip Products
Motorola	Electronics/Superconductor
Chandler Regional Hospital	Health Care
Ryobi Outdoor Products	Outdoor Power Equipment
Avnet Inc.	Electronic Components
Adflex Solutions	Flexible Circuits
Microchip Technology	Integrated Circuits
Durel Corporation	Electroluminescent Lighting
Rogers Corporation	Circuit Materials
Inter-tel, Inc.	Telecommunication
Allied Signal	Circuit Boards
MCI	Telemarketing
Orbital Sciences Corp.	Aerospace R & D
USA Group	Loan Processing
Gould Electronics Inc.	Copper Foil Products
Amkor Electronics Inc.	Integrated Circuit Packaging
Speedfam Corp.	Semiconductor Sales
Employment by Occupation	
Technical, Sales & Admin. Support	34.2%
Managerial & Professional Services	31.1%
Operators, Fabricators, Laborers	11.1%
Service Occupations	10.8%
Precision Production, Craft & Repair	10.8%
Farming, Forestry, & Fishery	2.0%
Source: Chandler Profile	

TABLE 1E**Per Capita Personal Income
Maricopa County, State of Arizona**

	1970	1980	1990	1994	Annual % Growth Rate
Maricopa County	\$4,099	\$10,313	\$18,256	\$21,364	7.1
State of Arizona	\$3,777	\$9,272	\$16,225	\$19,147	7.0
United States	\$4,047	\$9,940	\$18,666	\$21,696	7.2

Source: U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis

In 1994, Maricopa County had a per capita personal income of \$21,364. This PCPI ranked first in the State, and was 111.6 percent of the State average (\$19,147) and 98.5 percent of the national average (\$21,696). The average annual growth rate of PCPI over the 24 year period was 7.1 percent.

AIRPORT AREA LAND USE AND TRANSPORTATION CONSIDERATIONS

The City of Chandler has experienced strong residential and commercial growth in recent years, which has been spurred by the urban growth of the Phoenix Metropolitan Area. The availability of employment opportunities has contributed to the large influx of residents. Chandler ranks as the third fastest growing city (among those with population over 100,000) in the United States. Chandler has also experienced an increase in housing on an average monthly basis of 397 units in 1995 and 426 units in 1996. Chandler has developed from the northwestern corporate limits of the city, but limited space and expansion needs have required development to move southeasterly. Because development space is limited, residential and industrial/commercial needs are requiring development near the airport. At the current time, the airport is generally surrounded by agricultural uses. An area of residential development is located to the northwest.

A Review of the **Chandler Airpark Area Plan**, which was conducted by the

City of Chandler, indicates that areas immediately surrounding the south and east side of the airport are reserved for industrial/ support and commercial uses. Areas surrounding the north and west side of the airport are reserved for transitional/mixed uses and commercial development. These areas are generally compatible with airport uses and will help serve as a buffer. Just outside the "buffer" reserved areas to the north and south/southeast, residential development is planned. Planned land uses surrounding the airport are depicted on **Exhibit 1D**.

TRANSPORTATION NETWORK

The **Chandler Airpark Plan** also indicates planned new roadways within the vicinity of the airport. Two roadways are planned which will loop around the airport providing access to industrial and commercial areas. Also depicted on the plan is the proposed SANTAN Freeway. This freeway will link to I-10 to the west and will run east-west through the City of Chandler, then looping back towards the Superstition Freeway (State Highway 60). The SANTAN Freeway will be located approximately one mile north of the airport and will provide interchanges for airport access. Existing and planned roadways are illustrated on **Exhibit 1D**.

CLIMATE

Weather conditions play an important role in the planning and development of an airport. Temperature is an important factor in determining runway

length requirements. Wind direction and speed are used in determining optimum runway orientation. The percentage of time that visibility is impaired due to cloud coverage or other conditions is a major factor in determining the need for navigational aids and lighting.

Chandler's warm dry desert type climate is characterized by hot summers

and mild winters. An average maximum daily high temperature of 103.8 degrees (F) is experienced in July, the hottest month of the year. The coolest month is January with an average daily low temperature of 37.3 degrees (F). **Table 1F** provides a general tabulation of the weather characteristics experienced in the City of Chandler.

TABLE 1F

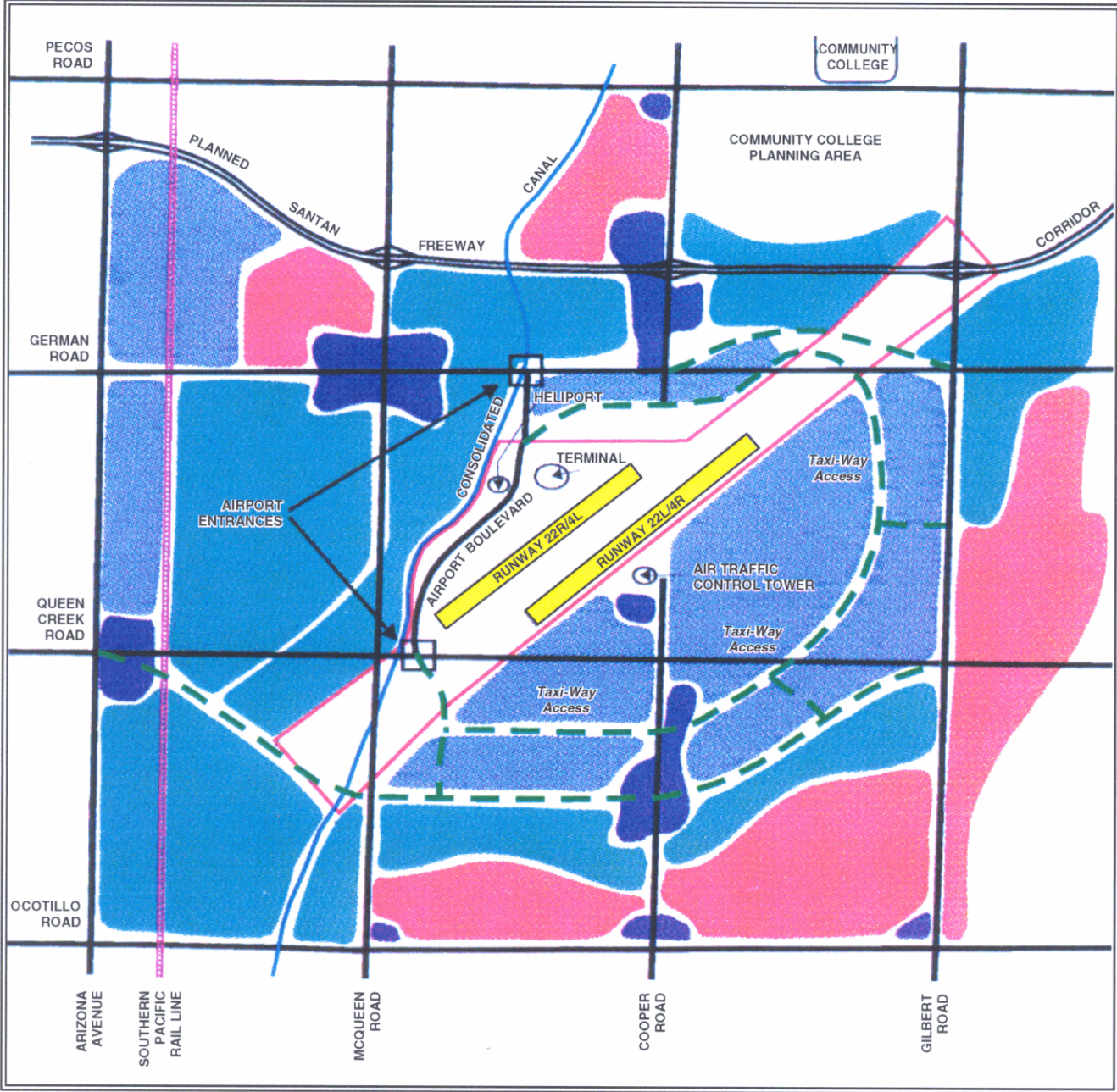
**Weather Summary
Chandler, Arizona**

Month	Average Temperature (°F)		Average Total Precipitation (inches)
	Daily Maximum	Daily Minimum	
January	65.0	37.3	0.84
February	69.6	40.3	0.82
March	74.4	44.2	0.83
April	84.1	51.2	0.32
May	93.2	59.1	0.14
June	101.1	67.4	0.09
July	103.8	76.4	0.81
August	101.2	74.2	1.42
September	98.0	68.2	0.99
October	87.0	56.6	0.63
November	75.5	44.7	0.55
December	66.3	38.0	0.98
Year	85.0	54.8	8.42
Average Total Snow, Sleet, and Hail Annually: Trace (based on a 30-year average)			
Source: Chandler Heights Reporting Station as presented in the Chandler Community Profile prepared by the Arizona			

Annual precipitation averages 8.42 inches with most of this rainfall occurring between December and March. There is also a late summer monsoon experienced in August and September which can produce frequent

periods of low visibility due to heavy rain and blowing dust associated with heavy thunderstorm activity.

Analysis of wind data depicted on the previous airport layout plan (ALP)



LEGEND

-  Industrial/Support Uses
-  Transitional/Mixed Uses
-  Residential
-  Commercial
-  Planned New Roadways



NORTH

NOT TO SCALE



windrose indicates that calm wind conditions prevail 43.5 percent of the year. Also, wind patterns for the Chandler Municipal Airport area are generally either out of the southwest or southeast.

SUMMARY

The information discussed on the previous pages provides a foundation upon which the remaining elements of

the planning process will be constructed. Information on current airport facilities and utilization will serve as a basis, with additional analysis and data collection, for the development of forecasts of aviation activity, and facility requirement determinations.

The inventory of existing conditions is the first step in the complex process of determining those factors which will meet projected aviation demand in the community and region.